



Photo: Whakanewha Regional Park, Waiheke Island. (Source: ARC)



Conclusion – State of the Auckland environment

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Conclusion

The complexity of natural systems is such that we may never know as much as we would like to about the state of our environment. We are only just beginning to understand the intricate relationships between species, populations and ecosystems, and also the interactions with people, both immediate and cumulative. However, as this report shows, we do know a great deal about many aspects of our environment based on over 20 years of monitoring and research.

This report sets out in detail what we do know about the environment – but what does this tell us? What should we take from this information as we look to the future?

Each chapter records ‘key findings’ and those are not repeated here, rather the critical issues identified through this report are summarised as follows¹:

- Although the overall picture is variable, most indicators suggest that the pressures of consumption and production continue largely unabated. With a growing population forecast, much depends on our future success in decoupling population and economic growth from production and consumption and/or the negative impacts of that production and consumption on the environment. In short, we need to become more resource efficient. That will require both technical advances and behavioural change. On that front, while rates of water consumption have fallen to internationally modest levels, there are challenges ahead in managing solid waste, energy demand and transport.
- Loss of land to urbanisation continues. Notwithstanding the Auckland Regional Growth Strategy, we continue to lose prime agricultural land to urbanisation. Outside the MUL residential development is intensifying – sometimes in environmentally sensitive locations. Rural activities are exposing land to increased risk of erosion, soil degradation and sediment loss to aquatic environments.
- With respect to air quality, emissions of PM₁₀ and PM_{2.5} particulates and NO₂ all need to be reduced substantially to meet national standards and protect human health. Motor vehicles and domestic heating are the major contributors of these pollutants.
- Water quality and ecological health in the region’s rivers are highly influenced by land cover in the catchment. Most of the rivers and lakes in the region are degraded to some extent. Urbanised catchments generally have poorest water quality although there are signs that this is improving. Lake water quality is degraded due principally to nutrient enrichment and invasion by exotic species.
- Plumes of sediment are often visible in the marine environment following large storms, with water clarity often taking several days to improve. Increased sedimentation is a real and significant impact impinging on aquatic environments. Large sediment runoff events can lead to sediment dumps, which smother marine life. Ongoing, incessant sedimentation leads to the slow, irreversible degradation of the marine environment, particularly in sheltered harbours and estuaries. Clear signs of this include increases in the “muddiness” of estuaries and mangrove expansion.
- Heavy metal contaminants in estuarine muddy habitats are impacting upon marine species leading to a decline in ecosystems adjacent to urbanised catchments. Concentrations of zinc in the sediments of estuaries and harbours are increasing and new organic contaminants are emerging as potential concerns. The stormwater system is the primary transporter of these contaminants. The ARC’s modelling shows that stormwater is contributing large volumes of sediment, zinc, copper and bacteria to aquatic systems. Zinc levels tend to be high from catchments with historically high industrial landuse. The extent of impervious surface within the metropolitan area has increased giving rise to greater stormwater volumes and contaminant loads. In addition there are a large number of overflows from the Auckland combined stormwater/wastewater system during wet weather, which will continue until these systems are fully separated.
- Coastal water quality around the region is generally improving. However, at some high quality sites there is an apparent decline in water quality due, in part, to continued input of sediment and nutrients from rural catchments.
- The region retains only 27 per cent of indigenous land cover but fortunately still contains a diverse range of New Zealand’s terrestrial biodiversity. Several ecosystem types are severely depleted in the region and are under threat from further loss and fragmentation of habitats (as a result of urban or rural land development) and the impacts of invasive species.
- Like most parts of the country, the Auckland region is exposed to a range of geological, climatic and coastal hazards. The majority of recent events have related to climatic hazards (flooding, landslides and cliff instability). Our vulnerability to these hazards changes over time as a result of our preparedness and our management of development and land use activities. Unfortunately, Aucklanders are generally not well prepared for natural hazards and lag well behind other regions.
- We know that efforts to record and give protected status to historic heritage have increased considerably in recent years. However, we know little about what is happening to historic heritage that is not already recorded and is potentially at risk from activities that do not require resource consent. Furthermore, we know little about the condition of some of the recorded resources and their vulnerability to natural or human induced deterioration. There are examples where historic heritage has degraded due to neglect, to the extent that demolition is the likely outcome.

Many of the negative trends highlighted in this report occur despite regulatory efforts by the ARC and other authorities. This illustrates that while regulation is important (and has probably been critical to arresting decline in the state of some natural resources) the mitigation of impacts possible through individual consent practices is limited. In reality, consented activities will still contribute to many of the environmental problems we face. This means that effective environmental management will always require more than simply requiring, considering, issuing and enforcing consents for individual activities. It will require careful planning (where trade-offs are made at a higher level), community and landowner

¹ A more comprehensive review of all the issues raised is repeated in the executive summary

engagement, public investment, inducements and initiatives. In doing so, we must carefully consider where the costs and benefits for these types of interventions lie to ensure that they are fairly and equitably allocated between the public and private sectors, without loading costs onto future generations.

It is also important to note that even after we have intervened it will take time, often decades, for results to be apparent in monitoring data.

This conclusion focuses on four key questions:

- How do current ARC priorities (measured by investment and policy attention) match against the critical issues outlined above?
- Where are we heading given the identified trends and current responses?
- How durable are the gains the ARC has already made?
- What challenges and opportunities lie ahead?

Current issues and priorities

Whilst the ARC has a broad portfolio of activity, like all organisations it has limited resources meaning it must prioritise where its efforts are directed. Amidst the reorganisation of Auckland governance and a global economic recession, the business of infrastructure provision (wastewater networks, transport systems, electrification and broadband), managing urban growth and rural productivity, and the protection of open space, landscapes and biodiversity must continue.

In recent years the ARC (together with its subsidiary, ARH) has directed by far the greatest proportion of its available financial resource into transport, specifically public transport delivered through ARTA. Public transport investment contributes towards improving air and stormwater quality, reducing land development impacts by reducing the need for road building and promoting urban intensification, and energy conservation.

Considerable resources are allocated to the acquisition, development and maintenance of regional parks. The parks are varied in size, nature, and purpose but many contribute to a range of environmental outcomes. The maintenance of open space, rural and coastal landscapes, and associated amenity is an obvious benefit of the park network. Also, parks are an important refuge for the protection and enhancement of indigenous biodiversity, and maintenance of freshwater quality. Further benefits accrue by reducing potential vulnerability to natural hazards particularly coastal flooding and erosion by ensuring key coastal land cannot be subject to development.

Other priorities include *stormwater management* and *pollution response*, which make an important contribution to water quality, ecosystem health and flood management. *Growth management* involves developing, supporting and monitoring the Auckland Regional Growth Strategy which focuses effort on integrating transport and land use planning with the aim of achieving a compact urban form. *Pest management* makes a major contribution to biodiversity protection across the region and specifically on regional parks. Priorities also extend to air, land, water and heritage management with much of this activity on planning and consent processing, monitoring and research, and assistance to individuals and groups through targeted programmes and partnerships.

It is clear from the above that at least at the broad level, our current spending priorities, and the outcomes we seek from them, match well against most of the critical issues identified in this report. Sometimes they do so directly and sometimes indirectly.

The work of the ARC is complemented by many other agencies including city and district councils, central government and non-governmental organisations and charities. Much of this work is directed and constrained by mandatory functions set out in various statutes and by regional community though the public processes required by those statutes.

In summary, although there will always be debate about which is the best approach to address each issue we can be confident that we are broadly on track given the responsibilities and powers we have.

Where we're heading

This report tells us a lot about where we are at and where we've been but what does it tell us about where we're heading? If we keep going with current trends and current responses what might our environment be like by the time the next state of the environment report is written? What about in the years beyond that as we move towards a population of two million?

Based on us continuing as we are, our future environment is likely to be as follows:

- Our air quality is likely to be similar to what we have today. Overall emissions from vehicles will be about the same despite improvements in vehicle technology simply because there are likely to be more kilometres travelled (notwithstanding public transport investment). Emissions from domestic home heating may decrease slowly but only to the extent that we meet internationally accepted air quality standards in about 25 years time. Although air quality is likely to remain the same, a larger and denser population will see more people exposed to air pollution with associated increases in mortality and reduced activity days (days when people feel too unwell to do their normal activities).
- Our freshwater quality is likely to be similar to today. Although we have clearly made gains in urban water quality in recent years it is likely that we have exhausted the potential improvements using the current approach to managing discharges. Freshwater quality in rural areas is similarly likely to stay the same although some marginal improvement may be expected if non regulatory approaches are effective. Opportunities for greater improvements abound, particularly if initiatives to improve riparian management are implemented. Rivers flowing through catchments converted from intensive rural land use to lifestyle blocks are likely to see water quality improvements through reductions in bacteria and nutrient levels and, in some cases, temperature. Some further deterioration of already degraded urban and rural rivers is likely as degraded rivers tend to receive little protection from activities that lead to further degradation. Exotic species are likely to continue to degrade lake water quality and ecology.

Conclusion

- Rural land will continue to be converted to urban uses and smaller rural parcels at a rate similar to today. Natural erosion of rural soils will fluctuate according to climatic events. Land disturbance will continue with bare soil potentially generating sediment. The propensity for this to occur will depend on land use and land management practices that are likely to be targeted in the review of the Auckland Regional Policy Statement. Soil quality is likely to degrade further with increased compaction, excess nutrients and changes in soil carbon levels which effect soil structure and nutrient retention.
- Our marine area is likely to continue to decline at a gradual rate, with many changes too subtle to observe until it is too late. Key changes are likely to be a decline in species diversity and loss of large species. Currently the most degraded marine areas are close to the centre of Auckland reflecting land use impacts. However this footprint of impact may spread further along Auckland's coastline as rural land practices generate discharges of nutrients and sediments and urban Auckland expands. While we have new technologies to reduce inputs from stormwater, the suite of contaminants we are dealing with is an increasingly complex mix and the cost of intervention can be prohibitive. As the region's population expands there will be increased access to, and use of, the marine environment creating additional pressures on marine resources such as space, food resources and minerals.
- At the regional scale, native habitats and threatened species will continue to decline in unprotected or unmanaged areas due to habitat loss, fragmentation and invasive species. Although there will be site-specific gains through individual and community driven efforts involving covenanting, pest control and revegetation as well as biodiversity recovery in regional parks.
- Natural hazards will continue to impact people and property in the Auckland region. As population growth and urban expansion increases, new areas will be exposed to natural hazards while the potential consequences of an event may become greater, even if the magnitude of environmental processes have not increased. The awareness of natural hazards, their impacts and the preparedness of communities and businesses is likely to remain an ongoing issue.

Overall, we need to recognise that as our population and economy grows and intensifies greater pressure will be put on our environment. Fortunately the quality of environmental management has also tended to improve over time and we have been able to apply better knowledge and technology to meet these challenges. There is little doubt though that unless we continue to improve our management of the environment some of the negative trends we see today will likely continue or even accelerate in the years ahead.

The gains we've made

While we began this concluding chapter focussing on the challenges we face, it is important also to recognise the gains we have made. There have been many and some are very significant. It is also important to recall that, while some of these gains are likely to be permanent because we have achieved a technological shift (such as improved vehicle emissions, or stormwater treatment), others remain vulnerable and can be easily lost.

In this 'vulnerable' category are those gains that relate to human behaviours and natural processes and/or which are dependent on organisational priority setting.

The most important gains vulnerable to reversal include:

- Pest management where many of millions of dollars have been spent to get pest numbers in ecologically important areas down to levels that do not impact significantly on biodiversity. Reducing effort in pest management could jeopardise past gains with pest populations able to rebuild in relatively short timeframes.
- Public transport that has seen huge growth in patronage as a result of greatly improved services and promotion to encourage people to use buses and trains. Reducing funding of public transport is likely to arrest these gains and potentially see people return to their cars.
- Urban growth management and the gradual buy-in to the idea that we need to move away from continual "build at the periphery" approach to accommodating urban growth. The development community has come a long way from the days of endless low rise sprawl and is embracing new forms of development that can position Auckland to grow with much less environmental impact.
- Community and landowner awareness of environmental issues and of their contribution to those issues and their resolution. In particular, the adoption of best practices in land management and maintaining community involvement in care groups is highly vulnerable to any withdrawal in effort.
- Environmental information that we have gained through years of building and refining monitoring programmes and recording data. This has enabled us to understand long term trends, make better management decisions and evaluate whether we are making a difference.

Looking ahead: the challenges and opportunities

Looking ahead it is clear that if we keep to the current path we will see some environmental gains occurring within an environment that is in gradual decline. Some of the hard won gains are potentially at risk if investment is not maintained and in some areas increased. But this outlook presents as many opportunities as it does challenges.

In many ways the information in this report confirms that we have exhausted the easy opportunities for environmental improvement, just as we should have. Like other cities in New Zealand and around the developed world we are at the cusp of a new era in environmental management. The relatively easy-to-deal-with point sources of pollution have been regulated and cleaned up. In Auckland, this is best illustrated by our success with improving wastewater discharges beginning with the relocation of wastewater

treatment to Mangere in the 1960s and the subsequent upgrade of many smaller treatment facilities and dairy shed discharges during the 1990s and 2000s. Air discharges from industry have also reduced.

Over the next decade we face the task of addressing the more challenging *diffuse* sources of pollution. These are discharges that do not emanate from a single pipe or stack, or even a single user but rather from multiple, small, difficult-to-target sources. Particular examples of concern include run-off from land into surface or ground water following rainfall or the cumulative contribution of many home fires burning during winter. This new focus will necessitate greater landowner and stakeholder engagement to manage land use practices more effectively.

This may also involve looking ‘up the pipe’ to focus on what happens before a discharge occurs and controlling contaminants at source (such as low impact design to stormwater and land management, which is a more proactive and more cost effective way to reduce pollution). In rural areas it will mean much greater scrutiny of land management practices.

These diffuse discharges mean we need greater integrated management across land and water resources. This is not a new concept but we have yet to fully realise its potential. In essence it means we need to manage the land to take care of the freshwater and marine environments. Managing the marine environment starts at the top of our highest ranges and hills. If we are good stewards of the land and better understand and take account of the multiple stresses the use of land causes, our aquatic environments stand a much better chance of providing the full range of ecosystem and recreational opportunities Aucklanders value so highly.

The idea of diffuse risk has parallels in the management of biodiversity where risks to habitats and species are now seldom from large scale land clearance but rather from hundreds and thousands of small scale impacts associated with disturbance to exposed edges of habitat and the diffuse impacts of pests. As with diffuse pollution, managing diffuse risk to indigenous biota and habitat is challenging because each contributing activity may in isolation be trivial but cumulatively they are a heavy burden on the environment.

Diffuse risks are difficult to regulate and can be expensive to address. In looking forward we will need to consider how to extract the best environmental dividend from the resources available. This may mean reconsidering existing priorities. We know for example that making gains in badly degraded urban environments can be very expensive and often the marginal gains from each dollar invested are small. On the other hand, in some of the region’s less developed but still degraded rural areas, relatively modest investment can produce substantial environmental improvement. With a fixed environmental budget we will need to think hard about where and how we should spend it to get maximum benefit for the region as a whole. This is likely to involve better targeting of funding to achieve best return on investment.

The challenges of the next 20 years may well require tools that we do not currently have and powers that we may never have. This will mean that we need to maintain a close working relationship with others, including central government. Our future success in securing good environmental outcomes for the region will always depend in part on convincing central government of the importance of our work. Whether it is

acquiring a modern public transport system or introducing national regulations on fuel standards an effective partnership with central government will be a key to success.

The future management of our environment will not be without debate. We will inevitably face conflicts between competing objectives. We know already that we need to manage intensification of metropolitan Auckland carefully if we are to avoid exposing more people to greater air pollution. We also know that in seeking to retain rural Auckland in primary productive use we need to be conscious of the impacts of such use particularly as the sector moves to more intensive production. We know too that the principle of “polluter pays” can be difficult when it extends to managing diffuse sources of contaminants and that the allocation of costs for resource management must be finely balanced between public and private cost and benefits. Our need to successfully reconcile these conflicts will grow in the years ahead.

Even more fundamentally, in managing our environment we need to be conscious of the difficult social and economic challenges that our region also faces. If care is not taken, our environmental management can exacerbate some of these challenges. Housing availability and consequential issues of affordability and overcrowding are some such issues. In all we do to manage the environment – in setting standards and in making a call on scarce public resources – we need to be cognisant of the implications for the people of Auckland and their ability to sustain happy, health lives and businesses.

On a positive note, the Auckland governance reform offers a real opportunity to more effectively address many of the issues that have proved difficult historically. Urban growth management and stormwater and wastewater system performance, in particular, are issues that require close integration between regional and territorial tiers of government. Moving to a single governance structure for the region offers an opportunity to move ahead on these and other issues with much greater confidence and efficiency. The settling of Treaty of Waitangi grievances and the aspirations of tangata whenua for co-management present yet more opportunities to exercise stewardship and kaitiakitanga in the best interests of all Aucklanders.

Finally, the future environment of Auckland and the challenges we face will evolve as climate change makes its presence felt. Every resource issue from air quality to biodiversity, stormwater to hazard management could be exacerbated by changes in temperature, precipitation and sea level.


For all the reasons above, the future will mean that choices need to be made between different objectives and outcomes. We cannot always “have it all”. This means that we need to establish clear regional goals and priorities. For a sustainable future many of these need to be set with the long-term view in mind – 50 to 100 years ahead – rather than the statutory planning horizon of 10 years that so often frames our work and limits our vision.

These are the challenges that lie ahead. They are challenges we must, and will, meet because our environment is worth the effort.

Acronyms & abbreviations



2004 Report	State of the Auckland Region Report 2004
ACC	Auckland City Council
ANZECC	Australian and New Zealand Environment and Conservation Council
ARC	Auckland Regional Council – Te Rauhitanga Taiao
ARH	Auckland Regional Holdings
ARPS	Auckland Regional Policy Statement
ARTA	Auckland Regional Transport Authority (formerly Transit)
ASF	Auckland Sustainability Framework
BOD	Biochemical Oxygen Demand
CCMP	Coastal Compartment Management Plan
CEF	Coastal Enhancement Fund
CHI	Cultural Heritage Inventory
CMA	Coastal Marine Area
DOC	Department of Conservation – Te Papa Atawhai
DRP	Dissolved Reactive Phosphorous
ED	Ecological District
EIF	Environmental Initiatives Fund
ENSO	El Niño Southern Oscillation
FDC	Franklin District Council
FORST	Foundation for Research, Science and Technology – Tuapapa Rangahau Putaiao
GIS	Geographic Information System
GDP	Gross Domestic Product
GNS Science	Institute of Geological and Nuclear Sciences – Te Pu Ao
GRP	Gross Regional Product
HCV	High Conservation Value
HPA	Historic Places Act (1993)
IA	Infrastructure Auckland
ICMP	Integrated Catchment Management Plan
LCDB	Land Cover Database
MCC	Manukau City Council – Te Kaunihera o Manukau
MCH	Ministry for Culture and Heritage – Te Manatu Taonga
MAF	Ministry of Agriculture and Forestry – Te Manatu Ahuwhenua, Ngaherehere
MED	Ministry of Economic Development – Manatu ohanga
MfE	Ministry for the Environment – Manatu mo te Taiao
MFish	Ministry of Fisheries – Te Tautiaki i nga tini a Tangaroa



Acronyms & abbreviations

MMA	Mooring Management Area
MOH	Ministry of Health – Manatu Hauora
MORST	Ministry of Research, Science, and Technology – Te Manatu Putaiao
MUL	Metropolitan Urban Limit (Figure 2, Part 1)
NES	National Environmental Standards
NIWA	National Institute of Water and Atmospheric Research Limited – Taihoro Nukurangi
NSCC	North Shore City Council
NZAA	New Zealand Archaeological Association
NZHPT	New Zealand Historic Places Trust – Pouhere Taonga
NZTA	New Zealand Transport Agency
PDC	Papakura District Council
QE II	Queen Elizabeth II National Trust
RDC	Rodney District Council
RMA	Resource Management Act (1991)
RPMS	Regional Pest Management Strategy
SNA	Significant Natural Area
SSWI	Sites of Special Wildlife Interest
SWAP	Auckland Regional Stormwater Action Plan
TLA	Territorial Local Authority
Treaty	Treaty of Waitangi – Te Tiriti o Waitangi
VKT	Vehicle Kilometres Travelled
VOC	Volatile Organic Compound
WCC	Waitakere District Council – Te Taiao o Waitakere
WERI	Wetlands of Ecological and Representative Importance
WHO	World Health Organisation

Auckland Regional Council – Te Rauhitanga Taiao

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